

Abstract

A trench DMOS transistor having overvoltage protection includes a substrate of a first conductivity type and a body region of a second conductivity type formed over the substrate. At least one trench extends through the body region and the substrate. An insulating layer lines the trench and overlies the body region. A conductive electrode is deposited in the trench so that it overlies the insulating layer. A source region of the first conductivity type is formed in the body region adjacent to the trench. An undoped polysilicon layer overlies a portion of the insulating layer. A plurality of cathode regions of the first conductivity type are formed in the undoped polysilicon layer. At least one anode region is in contact with adjacent ones of the plurality of cathode regions.